

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.:

Group Art Unit:

Inventors: Prosser et al.

Filed: Concurrently

Title: Cryogenic Air Separation System  
For Producing Elevated  
Pressure Nitrogen

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

In accordance with 37 CFR 1.51, 1.56 and 1.97 to 1.99, the following is a relevance statement on each citation listed on attached form PTO-1449, and is made of record to assist the Patent & Trademark Office in its examination of this application:

U.S. 4,453,957 – Pahade et al. discloses a cryogenic process to efficiently produce large quantities of nitrogen gas at elevated pressure by use of a double column and multiple condenser reboilers. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 4,783,209 – Erickson discloses a system for obtaining more refrigeration from a cold pressurized stream of nitrogen being expanded to discharge pressure wherein cold expansion is followed or preceded by warm compression of at least part of the same stream being expanded. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate

refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,197,296 – Prosser et al. discloses a cryogenic rectification system for producing elevated pressure product wherein the lower pressure column of a two column system is operated at elevated pressure and nitrogen-containing fluid taken from the upper portion of the lower pressure column is used to generate plant refrigeration. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.


U.S. 5,412,953 – Darredeau et al. discloses a system for the production of gaseous oxygen and/or gaseous nitrogen under pressure wherein an additional cycle fluid withdrawn from the double column is reheated, compressed to a high cycle pressure, cooled, a fraction thereof expanded with the production of external work, and the rest of the compressed additional cycle fluid is liquefied. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 5,675,977 – Prosser – discloses a cryogenic rectification system for producing oxygen and nitrogen employing a kettle liquid column which processes oxygen-enriched kettle liquid from a higher pressure column and which is reboiled by a fluid taken from below the top of the higher pressure column. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 6,286,336 – Prosser discloses a cryogenic air separation system particularly useful for producing elevated pressure product wherein additional reflux is generated by a heat pump circuit operating between the upper portion and an intermediate location of the lower pressure column of a double column. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

U.S. 6,543,253 – Schaub et al. discloses a method for providing refrigeration to a cryogenic rectification plant which enables the facile provision of varying amounts of refrigeration to the plant wherein a working fluid is pressurized in a recycle compressor, a first portion is at least partially condensed in a heat exchanger and passed into the plant, a second portion is cooled and then turboexpanded to generate refrigeration which is used to condense the first portion, with the resulting second portion returned to the recycle compressor. There is no disclosure of a cryogenic air separation system for producing elevated pressure nitrogen wherein a portion of the nitrogen product fed to the product compressor downstream of the primary heat exchanger is withdrawn as refrigerant nitrogen from the product compressor and turboexpanded to generate refrigeration for the system, and thus this patent neither discloses nor suggests applicants' claimed invention.

Respectfully submitted,

  
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